



# Restricted

## 1. Security Warning

The information contained in this document is the exclusive proprietary to Bellsing Inc., and should not be disclosed to any third party without the written consent of Bellsing Inc.

## 2. Environmental Requirement

This s product including all components must be free from lead (Pb) and other banned substances according to customer's requirements.

## 3. Record Update

Date	Version	Description	Editor
6/4/2021	A	Initial Release	Jerry
3/14/2022	B	Update Table1.3.3 sensitivity spec	Jerry
6/14/2022	C	Update Table1.3.4 sensitivity spec	LvQuanlong

## BSP060CAB16 dynamic speaker

### 1.1 Description

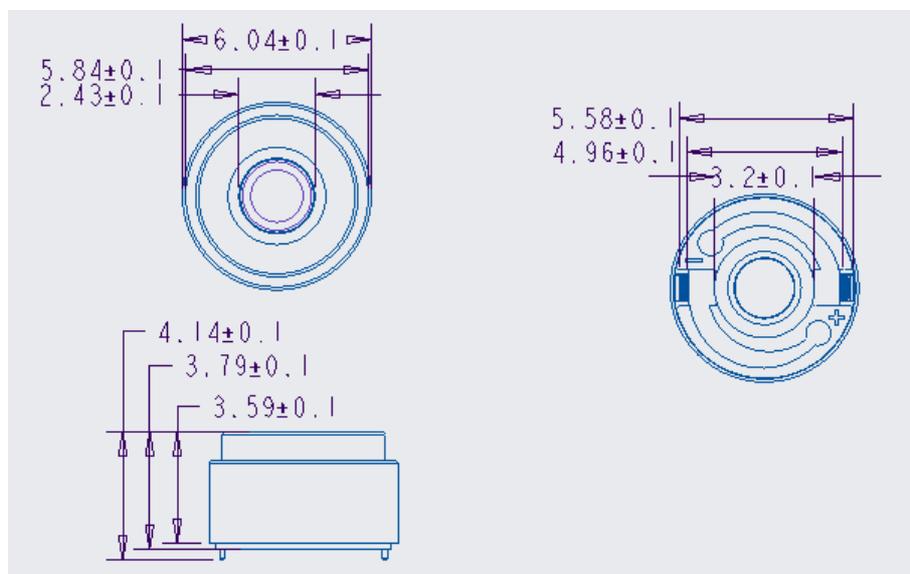
This product works on the principle of permanent magnet. When electro-magnetic field and voice coil, on which a vibration membrane is attached, receive a current signal, the membrane vibrates and the air around the diaphragm will be compressed. Sound will be induced through such kind of compression and then the electronic signal is transformed into sound signal.

The BSP060 is a high performance  $\Phi 6\text{mm}$  dynamic speaker, recommended to be used in consumer electronics inear products.

### 1.2 Mechanical Specification



Mechanical dimension: please refer to the drawing below

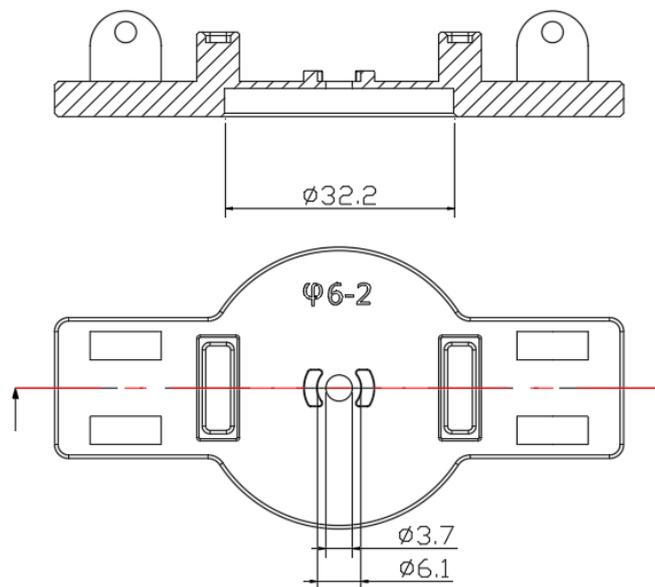
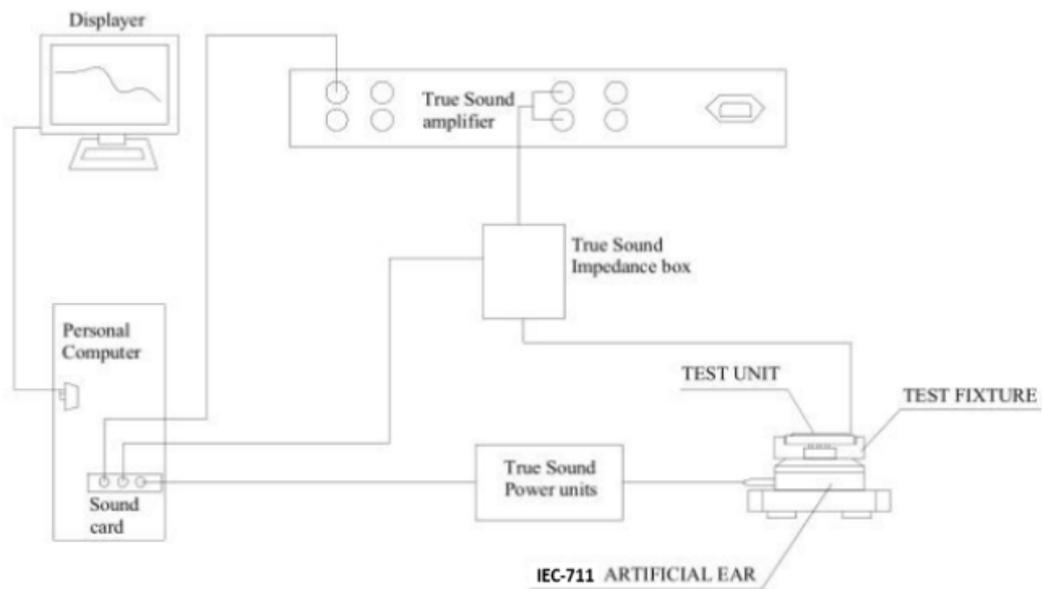


### 1.3 Electro-acoustic Specifications

#### 1.3.1 Operation and storage environment conditions

- Operating Temperature Range: -20°C to +60°C
- Storage Temperature Range: -20°C to +70°C

#### 1.3.2 Test Method



### 1.3.3 Electric-Acoustic Specification

Test Item	Nominal	Tolerance	Comments
Impedance	16	± 10%	
DC resistance	15	± 10%	
Rated power	5mW		
Maximum shor-term power	10mW		
Sound pressure level	102.5±3dB SPL at 1kHz		126mVrms IEC711
Resonance Frequency (F0)	400±20%Hz in free air		126mVrms
SPL	See Figure1		126mVrms
THD	See Figure2		126mVrms
Frequency Range	20~20kHz		
Rub & Buzz	Must be free audible noise from 50 Hz to 3KHz		400mVrms
Polarity	When a DC source's "+" polarity is attached to speaker's "+" polarity, and "-" polarity is attached to speaker's "-" polarity, the membrane will move towards "-" orientation.		

### 1.3.4 Nominal Frequency Response Curve

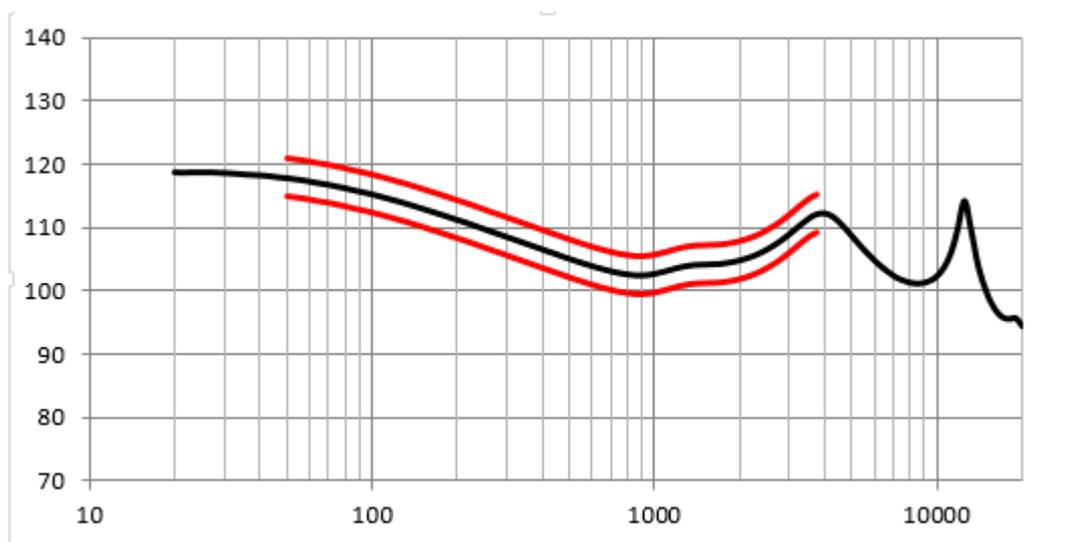


Figure 1 Typical FR curve

Test signal: 20Hz~20kHz, 1/24 Oct, 0.126Vrms, IEC standard 711 coupler

Frequency (Hz)	Upper limits (dB)	Lower limite (dB)
50-3750	+3	-3

### 1.3.5 THD

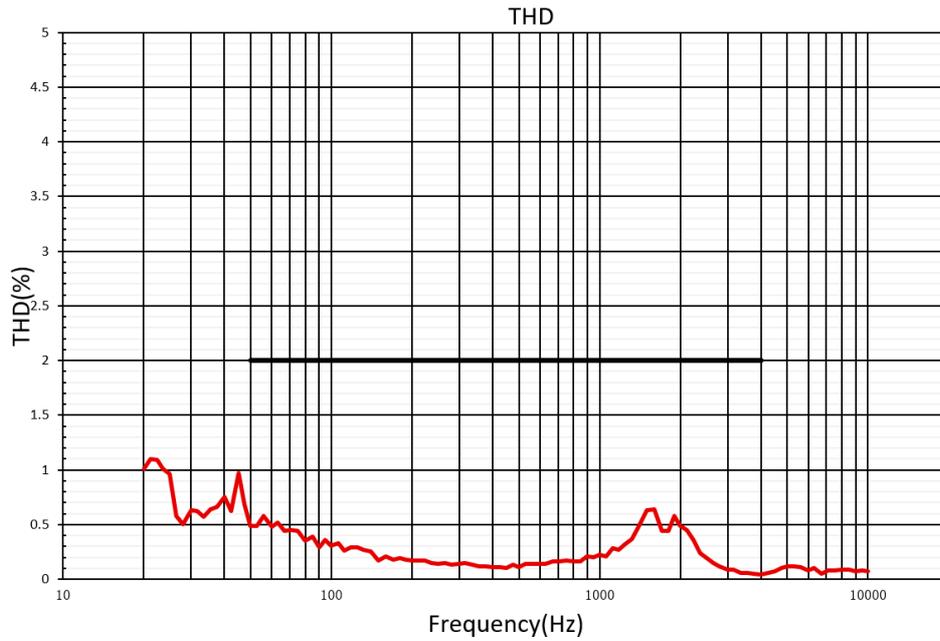


Figure 2 Typical THD curve

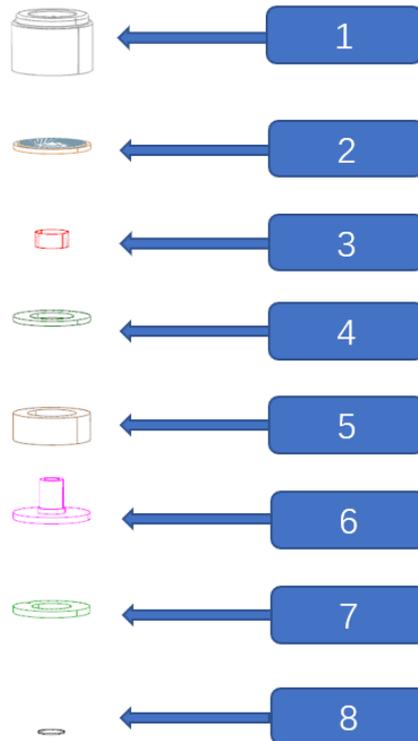
Test signal: 20Hz~20kHz, 1/24 Oct, 0.126Vrms, IEC standard 711 coupler

Frequency (Hz)	THD limits (%)
50~4000	2

### 1.3.6 TS parameters

T/S	NUMERICAL	UNIT
Mms	0.016	g
Fs	420	Hz
Sd	0.125	cm <sup>2</sup>
Re	15.38	Ohm
Qm	0.486	
Qe	4.419	
Qt	0.531	
Rm	0.017	kg/s
BL	0.501	N/A
Vas	0.0084	l
X-max	0.3	mm

### 1.4 Part list



PART NO.	PART NAME	Q'TY	MATERIAL
1	COVER	1	SUS301
2	DIAPHRAGM	1	PU+Ti
3	VOICE COIL	1	SDTH
4	PLATE	1	SPCC
5	Magnet	1	Nd-Fe-B
6	T-Yoke	1	SPCC
7	PCB	1	RA+CU
8	Dust mesh	1	Mesh

## 1.5 Reliability Test Criteria

After any following tests the response at 1KHz shall not deviate more than  $\pm 3\text{dB}$  from the initial value

No	Item	Test Conditions
1.5.1	High Temperature Life	Temperature: 70°C Duration: 96hrs, power off
1.5.2	Low Temperature Test Storage	Temperature: -25°C Duration: 96hrs, power off
1.5.3	Humidity Test	Temperature: 40 $\pm$ 3°C Humidity: 95%RH Duration: 96hrs, power off
1.5.4	High/ Low Temperature load	60°C, 8 hours, at rated power -20°C, 8 hours, at rated power
1.5.5	Drop Test	In X, Y and Z directions, the height of 1.20M falls 3 times in each direction (The products without front cover are placed in the protective shell)
1.5.6	Temperature Shock	Temperature: -25 $\pm$ 3°C, 25 $\pm$ 3°C, +70 $\pm$ 3°C Time:10 cycles 
1.5.7	Long Term Load Test	pink noise 5mW (0.28V) for 96 hours
1.5.8	Salt Spray Test	5% concentration sodium chloride solution PH value 6.7-7.2 Solution temperature in the experiment box 35 $\pm$ 2°C Air temperature of the experiment box is 47 $\pm$ 2°C Time is 24 hours
1.5.9	Short Term Maximum Power Load Test	pink noise, Max power, last for 1 second power on and 59 seconds power off, 60 times

## 1.6 Package

- 288 pcs speakers in each tray
- 20 trays in one inner pack
- 10 inner packs in one big carton